Orbiter
July 2019

Aerospace Interns Put Their Spin on Solar Gravity Lens Design

by **Conor Shine**
July 30, 2019

Aerospace interns Rina Onishi and Mikaela Dobbin work on their parts of the solar gravity lens design project. (Photo: Elisa Haber)

Some of the brightest minds at The Aerospace Corporation and NASA's Jet Propulsion Laboratory are hard at work on new concept for a solar gravity lens that would allow us to peer further into the outer reaches of our galaxy in search of signs of life.

But even experienced engineers and scientists can benefit from fresh perspectives and ideas, especially when facing complex technical challenges that haven't been encountered before.
That's where Aerospace's 2019 summer interns come in. A group of about 20 interns from across the company has been working through Aerospace's Concept Design Center to develop new ideas and create a design of their own for how a solar gravity lens could operate.

Last week, the group gathered in El Segundo, huddling around monitors and whiteboards as they worked to integrate the various subsystem designs they'd spent the summer researching.

"Because this mission is so ambitious and it's never been done before by any agency, there's no set solution," said Matthew Zola, an intern with Aerospace's Vehicle Design and Innovation Department who helped lead the project.

At it's most basic, the solar gravity lens concept involves swarms of small satellites that capture light that's been redirected by the sun's gravity, allowing for high resolution imaging of exoplanets that are not visible by even the most powerful telescopes.

The concept is decades away from coming to fruition, if it ever does, but it offers immense potential for examining the geological features of distant worlds and could even turn up signs of life far away.

Making a solar gravity lens a reality comes with a host of challenges, starting with the fact that the satellites would need to be deployed to a distance of 550 astronomical units – roughly the distance of three light days — in order for it to function.

This creates a need to make the vehicles as small as possible for the long journey ahead, while still fitting in the necessary propulsion, power, communication and other systems needed to complete its mission.

Aerospace interns investigated a number of these challenges, exploring what's possible now and what new capabilities technology could enable in the future.

The intern's exercise resulted in conceptual designs for two configurations of the spacecraft that could satisfy the mission requirements. The group will present their findings to Aerospace managers and employees this week. Team members are also writing an Aerospace Technical Memorandum to preserve their findings for future teams working on the solar gravity lens.

Among the cutting-edge ideas the intern group has studied is a carbon coating that would be applied to the light sail propelling the spacecraft, which would sublimate and generate additional thrust as it passed near the sun before shooting out past the confines of our solar system.

Interns have also been studying the thermal packaging needed to protect the satellite as it passes near the sun and the type of antennas that would be needed to beam back images to Earth gathered by the satellite cluster billions of miles away.

Rina Onishi, who is studying aerospace engineering at Stanford University, was responsible for technology forecasting in the design exercise.

That included looking at the various solutions available now and their limitations, as well as how far into the future new technologies would feasibly be available to use in the design.

“It challenges a lot of assumptions. This mission is really far away. It involves technology that’s still developing that needs to be introduced to make this happen,” she said. “We have to use imagination, try to be creative to say ‘What would be a possible way to solve this?’”

Five Additional Tech Fellows Appointed as Part of New Technical Career Path

July 24, 2019

Five new Technical Fellows have been appointed for 2019 as part of a revamped Fellows program at Aerospace.

The Fellows program is now part of a newly established technical leadership career path for scientists and engineers who prefer not to hold management positions. The goal is to allow the Aerospace technical workforce to determine their career objectives, develop a plan, and pursue different opportunities. The new career path also strengthens the breadth and depth of the technical workforce, engages and retains technical talent, and builds a pipeline of future technical leaders.

The technical leadership career path allows vertical and horizontal movement at each of several levels.

Levels 1 through 3 will remain the same as before. However, while a Level 4 staff position was previously considered only when there was a specific need, there will now be a new “promotion in place” possible, called a principal engineer or scientist, based on professional accomplishments, contributions to organization and company performance, and leadership attributes associated with the new Leadership Competency Model.

Some of the Aerospace Technical Fellows with Steve Isakowitz, left, and Dr. Wayne Goodman, right. (Photo: Gabrielle Robinson)

Technical Leadership Career Path

Level 1-3 Staff
Level 4 Principal Engineer/Scientist
Level 4 Distinguished Engineer/Scientist
Level 4 Technical Fellow

New Technical Fellows

- Ric Agardy, SSG
- Bob Bitten, CSG
- Ranwa Haddad, SSG
- Inki Min, ETG
- Allyson Yarbrough, ETG

Beyond the principal engineer/scientist is the distinguished engineer/scientist. This position was reestablished to recognize preeminent technical contributors in their field. They will continue to support programs as technical experts.

Finally, the Technical Fellows will have broader corporate responsibilities including leadership of strategic projects, mentoring, and participation in various technical leadership activities.

“The Technical Fellows are essential to the health of The Aerospace Corporation,” said Dr. Dave Miller, chief technology officer and leader of the program. “Not only does the Fellows program recognize the fundamental role that science and technology play in Aerospace’s mission, but it also provides a promotion path for those thought leaders that Aerospace needs to maintain its technical excellence.”

Some of the Aerospace Technical Fellows with Steve Isakowitz, left, and Dr. Wayne Goodman, right. (Photo: Gabrielle Robinson)

Technical Fellows

Ric Agardy, SSG
William Ailor, ETG
James Anderson, SSG
James Barrie, ETG
Nat Bhaskar, DSG
Bob Bitten, CSG
James Camparo, ETG
Peter Carian, ETG
Boyd Carter, ETG
Robert Dybdal, ETG
Renny Fields, ETG
Peter Fuqua, ETG
Sergio Guarro, ETG
John Hackwell, OCTO
Ranwa Haddad, SSG
Lawrence Harzstark, ETG
Bernardo Higuera, CSG
Felix Hoots, ETG
Ronald Hopkins, ETG
Eric Johnson, ETG
David Landis, ETG
Mark Maier, ETG
Michael Meshishnek, ETG
Inki Min, ETG
Jay Penn, SSG
Enold Pierre-Louis, ETG
John Scarpulla, ETG
Matthew Smith, ETG
Gary Stupian, ETG
Allyson Yarbrough, ETG
Albert Zimmerman, ETG

Aerospace Employees Take to the Beach for Annual Summer Games

by **Conor Shine**
July 23, 2019

The Aerospace Corporation employees made a strong showing at this year's Aerospace Summer Games. (Photo: Gabrielle Robinson)

Hundreds of The Aerospace Corporation employees turned out for a day of fun and sun at El Segundo's Dockweiler Beach this weekend, where they competed against their peers from 32 local aerospace and aviation companies in the annual Aerospace Summer Games.

Aerospace's "A-Team" kicked, tossed, ate and donated their way across 11 events that tested their athleticism and teamwork, securing a Top 10 overall finish at the games. Northrop Grumman emerged the winner, followed closely by NASA's JPL team.

Aerospace's performance included a first-place finish in the event's canned food drive, with Aerospace employees donating hundreds of dollars worth of goods to a local charity. Aerospace employees also notched a fifth-place finish in the Human Pyramid competition and took sixth in Ultimate Frisbee.

The Aerospace Corporation employees compete in the Tug of War event. (Photo: Gabrielle Robinson)

Aerospace employees coordinated the Summer Games' Executive Masters Golf event, which saw leaders from various companies, including Aerospace's own Randy Kendall and Tim Graves, chip their way around the beach.

Aerospace Marks 10 Years of Helping High School Interns on Their Way to College and Beyond

by **Conor Shine**
July 18, 2019

For decades, The Aerospace Corporation's internship program has been a launching pad for college students and recent graduates on their way to impactful careers in science and engineering.

But the company also plays a role helping high school students navigate their way to college, providing exposure to a professional work environment and developing skills they'll use in future endeavors.

"Going in to Aerospace, I was a very introverted teenager who struggled to vocalize her ideas. It was extremely nerve wracking to work among such prominent, accomplished people," said Cecilia Valencia, who interned with Aerospace in 2018 through the Constitutional Rights Foundation's Expanding Horizons Internship program. "The welcoming, accepting, and diverse environment that thrives at Aerospace gave me a sense of belonging. This sense of belonging allowed me leave my shell and become more present."

Kayla Bonilla and Skye Carbajal spent the summer interning with Aerospace Corporation as part of the Expanding Horizons Internships program.

Valencia, who will attend Stanford University on a full scholarship this fall to study neuropsychology, is just one of many success stories from Aerospace's involvement with the Constitutional Rights Foundation. a partnership that's now in its tenth year.

Established in 1995, the foundation's Expanding Horizons Internships serves low-income, first-generation students who are college bound, providing intensive college and career preparation in addition to paid professional internship experiences.

Senior program director Lourdes Morales said the Expanding Horizons Internships is part of the Constitutional Rights Foundation's mission to improve educational achievement and civic engagement among young people.

"Young people are always asked what are you going to do when you grow up? Coming from these environments it can be hard. There are so many careers, it's hard to know what's out there," Lourdes said. "Students get the feeling, if I work hard, I could be in this environment. It's open to all of us if I put the work in."

Aerospace has hosted nearly two dozen students through the program over the last ten years, including a pair this summer who completed their internships with the company earlier this month.

"Having no other work experience, it was kind of daunting at first going into a corporate environment. Having to dress professional everyday, wearing a badge, talking about security stuff," said Skye Carbajal, who will be a senior this fall at San Pedro High School. "It's nice being here. I like that it's a campus."

Carbajal and her fellow intern Kayla Bonilla spent the summer working on a number of projects, including helping security with new-hire orientation, supporting the 2019 Corporate Awards and data entry tasks.

"I think most people think of Aerospace or NASA as only labs and lab work. It's cool to see how much goes into it, that it's not just labs and scientists," said Bonilla, who will be a junior this fall at Teach Tech Charter High School.

Carbajal and Bonilla join a long line of Aerospace interns from the program that are either continuing their studies at the collegiate level or who have graduated into the job market.

Anderson Furlanetto interned with Aerospace in 2016 and is now a rising junior at Johns Hopkins University studying mechanical engineering with an interest in defense and space. He participates in an on-campus engineering lab that develops instruments for scientific research in astronomy, condensed matter physics and high energy physics.

"Interning at Aerospace was a valuable experience because it helped jumpstart my career by giving me hands-on experience while being mentored by experts that helped me guide my path to today."

July 2019 Obituaries

by **Christine T Kato**
July 01, 2019

Sincere sympathy is extended to the families of:

Robert Ammons, member of technical staff, hired Oct. 4, 1977, retired Oct. 1, 1996, died June 19, 2019
Bernard Beskind, member of technical staff, hired June 12, 1961, retired Oct. 1, 1996, died June 2, 2019
Jean Bopp, office of technical support, hired Nov. 5, 1973, retired Aug. 1, 1983, died June 12, 2019
Leopold Cantafio, member of technical staff, hired June 21, 1965, retired Feb. 1, 1983, died May 12, 2019
Barbara Corn, member of technical staff, hired Sept. 17, 1973, retired Dec. 1, 1993, died June 8, 2019
Jeffrey Denner, member of technical staff, hired Oct. 29, 1979, retired Oct. 1, 2004, died June 18, 2019
Toshi Fujikawa, office of technical support, hired Dec. 31, 1964, retired Oct. 1, 1993, died April 16, 2019
Elaine Lydon, member of administrative staff, hired Nov. 5, 1973, retired April 1, 2004, died June 18, 2019
Bonita Newsom, office of technical support, hired May 14, 1962, retired Dec. 1, 1986, died May 21, 2019
Edward Paulsen, member of administrative staff, hired Oct. 7, 1960, retired Nov. 1, 1991, died June 4, 2019
Michael Quandt, member of technical staff, hired Jan. 2, 1962, retired Feb. 1, 1994, died May 28, 2019
Ray Spreier, member of technical staff, hired April 5, 1976, retired June 1, 2000, died June 25, 2019
Kenneth Tanaka, member of administrative staff, hired Oct. 3, 1960, retired Oct. 1, 1996, died Feb. 16, 2019
Neal Vocke, member of administrative staff, hired Oct. 3, 1960, retired Oct. 1, 1977, died June 12, 2019

To notify Aerospace of a death and have it included in the Orbiter, please contact People Operations at (310) 336-5107.

These articles are reprinted from The Orbiter, a publication of The Aerospace Corporation 2310 E. El Segundo Blvd., El Segundo, CA 90245-4691 310-336-5000
Visit: Aerospace.org
Contact Orbiter staff: Orbiter@aero.org

www.aerospace.org

AEROSPACE